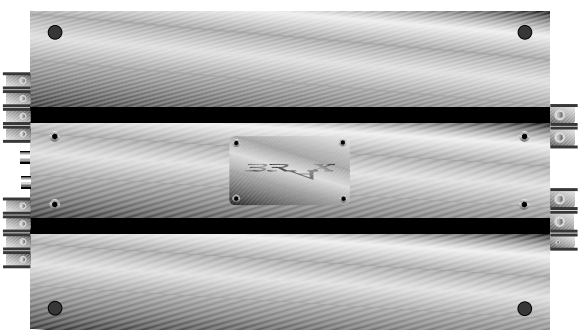
INNOVATIVE AUDIO PERFORMANCES
MADE IN GERMANY

X 1400
X 2400
4-Channel Amplifier



Instruction Manual

Introduction

Dear Customer,

Congratulations on your purchase of this high-quality BRAX product.

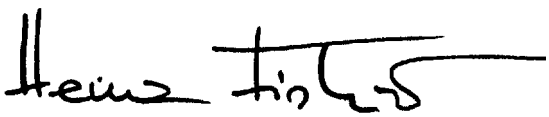
You may be interested to know that we have been working now for 18 years in the development and production of top-quality high-end hifi components.

Within just a few years, we have succeeded in giving the BRAX brandname world wide recognition. Our efforts in creating these quality products have also been rewarded through the award of various honours by the major car audio magazines, not to mention numerous world wide innovation prizes.

In keeping with the tradition thus established, we have again provided our new BRAX amplifiers with everything they require in order to assume their rightful position as the pace-setters in the market. Offering the maximum possible level of engineering quality, they combine outstanding sound reproduction, solid craftmanship and the noblest of materials to provide a completely new dimension in individuality.

We are proud to offer you this high-end product MADE IN GERMANY. and wish you many hours of enjoyment with your new BRAX amplifier.

AUDIOTEC FISCHER GMBH



Heinz Fischer

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In order to maintain the quality of this product and ensure safe operation, we recommend that our amplifiers be installed by an authorized BRAX dealer. Installation by a qualified and accredited technician will qualify you for our special lifetime warranty. Your BRAX dealer will also assist you in selecting the correct additional components and in ensuring that proper consideration is given to all the safety and sound-related aspects.

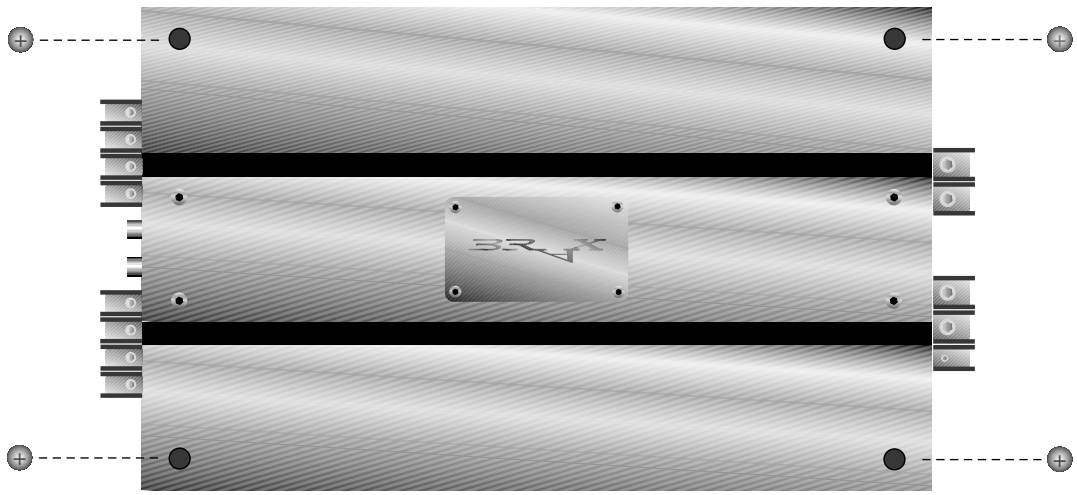
Important:

Before commencing installation, disconnect the car battery at the negative terminal. Once again we would urge you to have the installation work carried out by a specialist, as verification of correct installation and connection of the unit is a prerequisite for warranty cover of the BRAX by AUDIOTEC FISCHER Germany.

1.
Install your amplifier at a dry location in the car where there is sufficient air circulation to ensure adequate cooling of the equipment. Also ensure that there is sufficient clearance available for making the cable connections and operating the controls.

2.
For safety reasons, the amplifier must be secured in a professional manner. This is performed by means of four fixing screws (see Fig. 2) screwed into a mounting surface offering sufficient retention and stability. Before drilling the holes for the screws, carefully examine the area around the installation position and make sure that there are no electrical cables or components, hydraulic brake lines or any part of the petrol tank located behind the mounting surface - otherwise these could be damaged. You should be aware of the fact that such components may also be concealed in the double-skin trim panels/moldings.

Fig. 1: Installation in the car



Installation and Connection of BRAX Amplifiers X 1400 and X 2400

The above amplifier models may only be installed in motor vehicles which have a 12-volt negative terminal connected to the chassis ground. Any other system could cause damage to the amplifier and the electrical system of the vehicle.

The positive lead from the battery for the complete system should be provided with a line fuse at a distance of max. 30 cm from the battery. The amperage rating of the fuse is calculated from the maximum total current input of the car/vehicle hifi system.

Never bridge fuses or replace them with fuses with a higher amperage rating as such actions could lead to the destruction both of the amplifier and the entire electrical system of the vehicle.

As already mentioned, the negative lead from the vehicle battery to the chassis should be disconnected in order to prevent the occurence of short-circuiting. Install the cabling in a manner which precludes any danger of the leads being exposed to shear, crushing or rupture forces. If there are sharp edges in the vicinity (e.g holes in the body work), all the cables must be cushioned and protected to prevent fraying.

Never lay the power supply cables adjacent to leads and lines connecting other vehicle equipment (fan motors, fire detection modules, gas/petrol lines etc.).

In order to avoid cross-talk distortion, audio cables should never be laid together with electrical leads (with the exception of the screened BRAX POWER TRAX power supply cables).

In order to ensure safe installation, use only high-quality connection materials, and comply with the recommended minimum cross sections/gauge values of the cables for the individual amplifier modules.

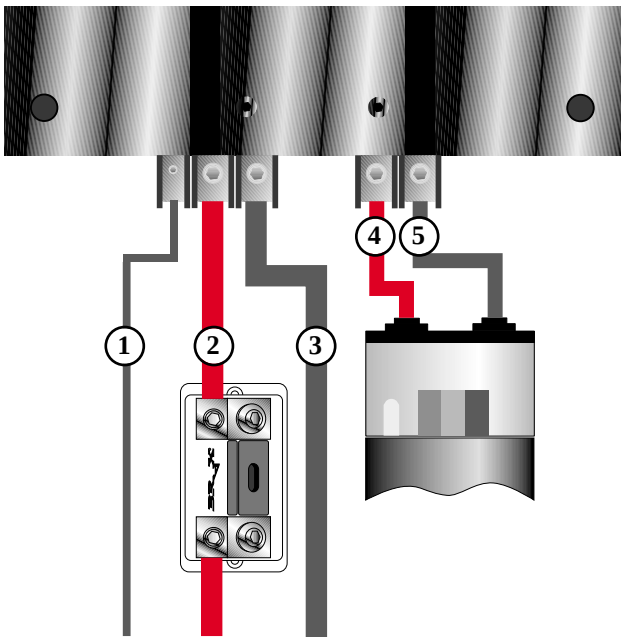
As an aid to calculating the cross-sectional requirements of power cables which are not longer than 5 m, we advise a figure of max. 5 A per mm^2. For the X 1400 BRAX amplifiers described, we recommend a minimum cross section of 12 mm^2/gauge 7, and for the X 2400 a minimum cross section of 20 mm^2/gauge 5 for the positive 12-volt supply lead and for the ground (chassis) cable. In order to ensure optimum sound quality and interference-free music reproduction, we recommend that installation be performed with BRAX POWER TRAX power supply cables. The remote lead should have a cross section of at least 1 mm^2.

Connection of the Power Supply

The +12 volt power supply cable (see Fig. 2) should be connected directly to the positive terminal of the battery. A fuse should also be provided at a distance of max. 30 cm from the battery. The amperage rating of the fuse is calculated from the maximum total current input of the car/vehicle hifi system. The fuse holder appertaining to the amplifier is supplied with the amplifier module. This must be installed at a distance of max. 20 cm from the positive terminal of the amplifier and equipped with the original BRAX fuse provided. The fuse ratings are: for amplifier X 1400 = 60 A,
for amplifier X 2400 = 100 A.
Failure to comply nullifies the warranty.

The ground (chassis) cable (see Fig. 2) should be connected to the central ground reference point (this is located where the negative terminal of the battery is grounded at the metal chassis of the vehicle), or to a bright bare-metal location on the vehicle chassis, i.e. an area which has been cleaned of all paint residues. It must be ensured that resistance values to the power sources (alternator, generator, battery) are minimized as excessive resistance can appreciably affect the audio quality and dynamics of the system. The „Remote“ cable (see Fig. 2) is connected to the „Remote“ connection or the automatic antenna connection of the control unit (tuner/radio). The antenna connection is only activated if the control unit is switched ON. This ensures that, with the control unit switched off, the amplifier is also switched off to safe the battery.

Fig. 2

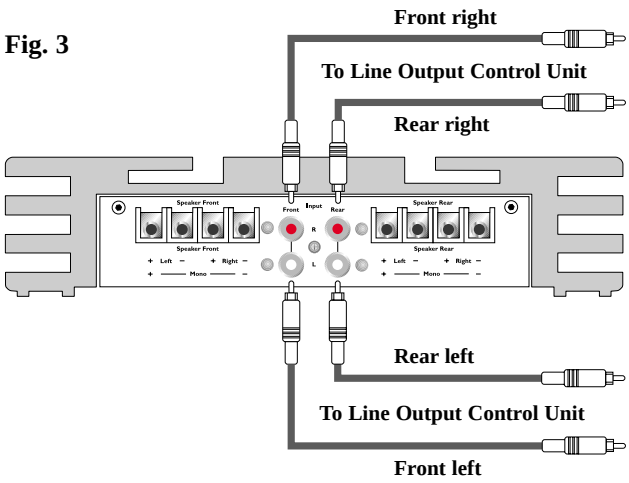


1. Control lead (Remote)
2. Positive (+) 12V cable via fuse to battery
3. Ground cable
4. Positive (+) connection BRAX Power Stabilizer
5. Negative (-) connection BRAX Power Stabilizer

Connection of the Signal Cables

The BRAX amplifiers have RCA connectors for cinch cables which are connected to the pre-amplifier outputs or line outputs of the control unit (tuner/radio). Ask your dealer for the appropriate BRAX accessories.

Fig. 3



Connection of the Speaker Cables

Important!

Never connect the speaker cables to the vehicle chassis. This can destroy your amplifier. Ensure that all the speaker systems are connected in-phase, i.e. plus to plus and minus to minus. The positive terminal is indicated on most speakers. In addition, the amplifiers may be operated in 2-channel mode (see Fig. 5), 3-channel mode (see Fig. 6) and 4-channel mode (see Fig. 7).

The mono/stereo selector switch is located at the bottom of the amplifier. The function of the switch is described on a label at the bottom of the amplifier (see Fig. 4).

Fig. 4: Stereo/mono selector switch

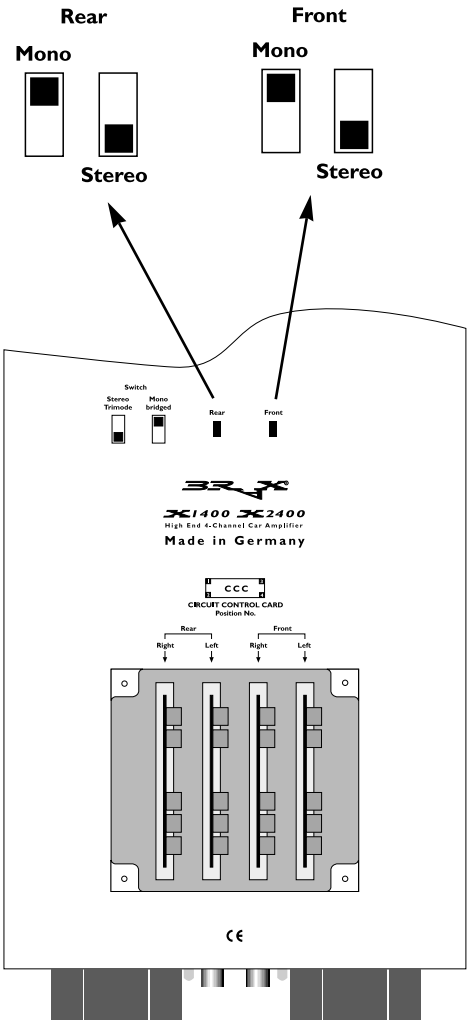
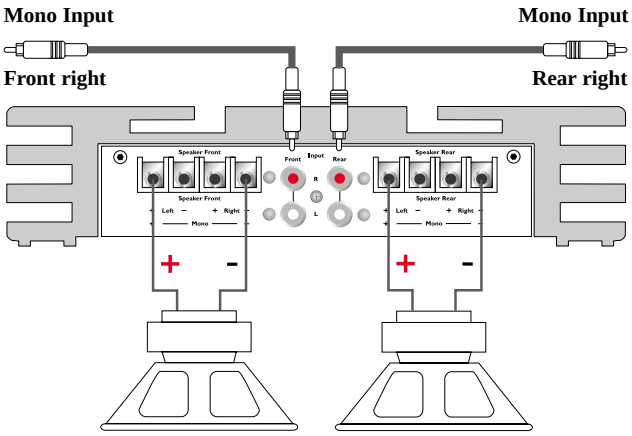


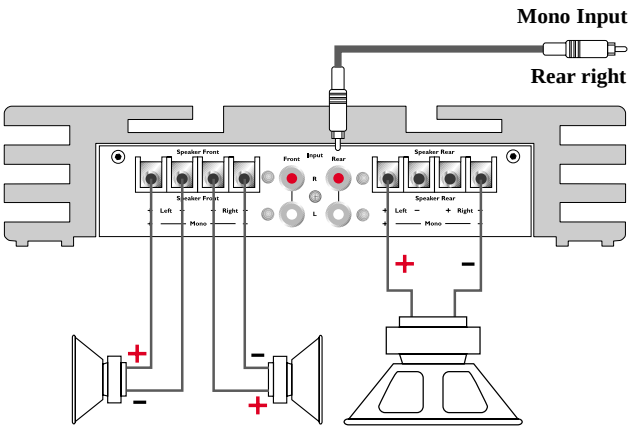
Fig. 5: 2-Channel Mode



Position of selector switch at the bottom of the amplifier:

Rear = Mono
Front = Mono (see Fig. 4)

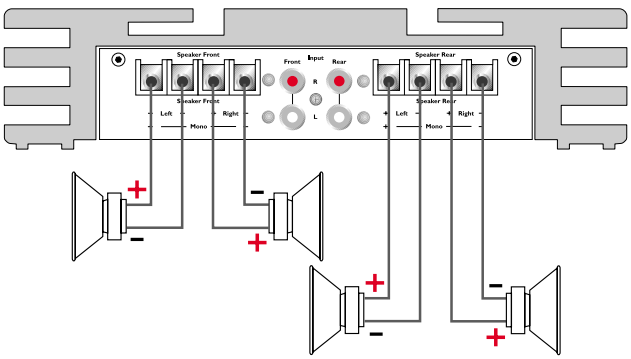
Fig. 6: 3-Channel Mode



Position of selector switch at the bottom of the amplifier:

Rear = Mono
Front = Stereo (see Fig. 4)

Fig. 7: 4-Channel Mode



Position of selector switch at the bottom of the amplifier:

Rear = Stereo
Front = Stereo (see Fig. 4)

The operating range of the amplifier is determined by replaceable Circuit Control Cards (CCC). If no special requirements regarding the CCC's are specified when ordering, the amplifier is supplied as standard with CCC 1. CCC 1 is plugged in at socket position 3 which means that the amlifier is operating in the full range (see list on page 8). If CCC 1 is inserted at socket position 1 or 2, as described in Fig. 8 to 12, the amplifier operates with a subsonic filter having a rate of change of 18 dB/Oct. from 45 Hz.
The various Circuit Control Cards available are indicated in the list on page 8.

Example: If you wish to use the module as a subwoofer amplifier, with the subwoofer being operated at 90 Hz, you find the corresponding Circuit Control Card from the list (in this case CCC 5) and insert the card in your BRAX amplifier at position 2 of that channel which is to control the subwoofer - the right channel in the case of the mono mode (bridge mode). Now the amplifier will only process frequencies **up to** 90 Hz, with any frequencies above that value being suppressed at the rate of change of 18 dB/Oct. At position 1 the amplifier will only process frequencies **higher than** 90 Hz.

Handling the Circuit Control Cards

Removal of a Circuit Control Card

1. Unlock the catches left and right on the base of the card (Fig. 8).

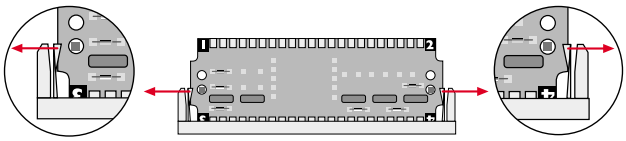


Fig. 8

2. Tilt the card approx. 15° in order to detach it from the base (see Fig. 9)

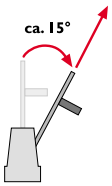


Fig. 9

Inserting the Circuit Control Card

1. Choose the position number from the CCC list which corresponds to the required function of the amplifier, and insert the card in the base so that the position number on the card is located at the top at the housing cover next to the arrows according to the channels (see Figs. 11 and 12).

2. Insert the card at an angle of approx. 15° so that it fits properly into the socket. Press the card between the clips so that it is secure in the base (Fig. 10).

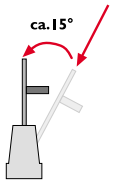


Fig. 10

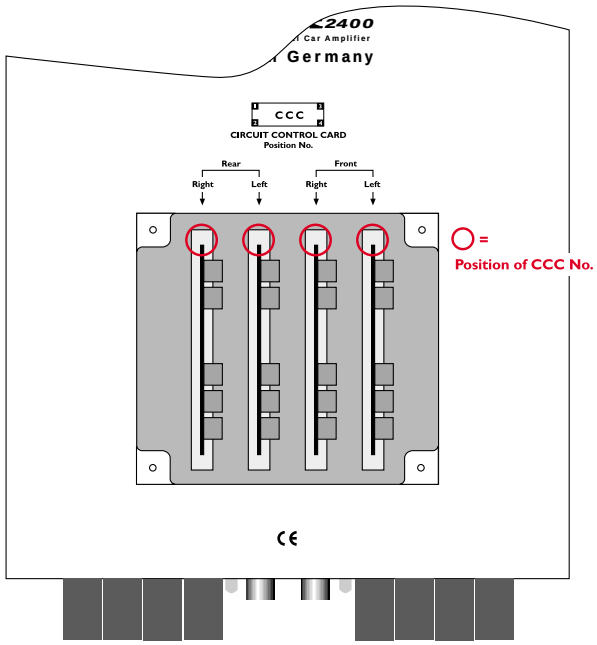


Fig. 11

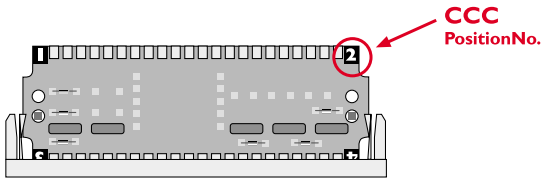


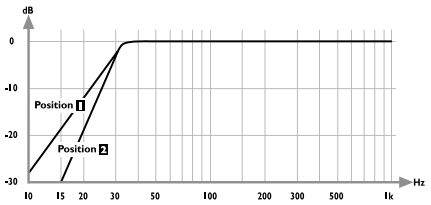
Fig. 12

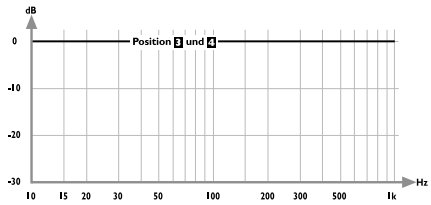
List of Circuit Control Cards (CCC)

Card No.	Type	Frequency in Hz	CCC Position No.			
			1	2	3	4
CCC 1	A	45	subsonic 18 dB/Oct.		full range	
CCC 2	B	50	highpass 18 dB/Oct.	lowpass 18 dB/Oct.	full range	
CCC 3	B	70	highpass 18 dB/Oct.	lowpass 18 dB/Oct.	full range	
CCC 4	B	80	highpass 18 dB/Oct.	lowpass 18 dB/Oct.	full range	
CCC 5	B	90	highpass 18 dB/Oct.	lowpass 18 dB/Oct.	full range	
CCC 6	B	100	highpass 18 dB/Oct.	lowpass 18 dB/Oct.	full range	
CCC 7	B	120	highpass 18 dB/Oct.	lowpass 18 dB/Oct.	full range	
CCC 8	B	150	highpass 18 dB/Oct.	lowpass 18 dB/Oct.	full range	
CCC 9	B	180	highpass 18 dB/Oct.	lowpass 18 dB/Oct.	full range	
CCC 10	B	200	highpass 18 dB/Oct.	lowpass 18 dB/Oct.	full range	
CCC 11	B	400	highpass 18 dB/Oct.	lowpass 18 dB/Oct.	full range	
CCC 12	B	600	highpass 18 dB/Oct.	lowpass 18 dB/Oct.	full range	
CCC 13	B	800	highpass 18 dB/Oct.	lowpass 18 dB/Oct.	full range	
CCC 14	B	1000	highpass 18 dB/Oct.	lowpass 18 dB/Oct.	full range	
CCC 15	B	1200	highpass 18 dB/Oct.	lowpass 18 dB/Oct.	full range	
CCC 16	B	2400	highpass 18 dB/Oct.	lowpass 18 dB/Oct.	full range	
CCC 17	B	4200	highpass 18 dB/Oct.	lowpass 18 dB/Oct.	full range	
CCC 18	C	50	highpass 18 dB/Oct.	lowpass 18 dB/Oct. incl. subsonicfilter 26 Hz; 30 dB/Oct.	full range	
CCC 19	C	70	highpass 18 dB/Oct.	lowpass 18 dB/Oct. incl. subsonicfilter 26 Hz; 30 dB/Oct.	full range	
CCC 20	C	80	highpass 18 dB/Oct.	lowpass 18 dB/Oct. incl. subsonicfilter 26 Hz; 30 dB/Oct.	full range	
CCC 21	C	90	highpass 18 dB/Oct.	lowpass 18 dB/Oct. incl. subsonicfilter 26 Hz; 30 dB/Oct.	full range	
CCC 22	C	100	highpass 18 dB/Oct.	lowpass 18 dB/Oct. incl. subsonicfilter 26 Hz; 30 dB/Oct.	full range	
CCC 23	C	120	highpass 18 dB/Oct.	lowpass 18 dB/Oct. incl. subsonicfilter 26 Hz; 30 dB/Oct.	full range	

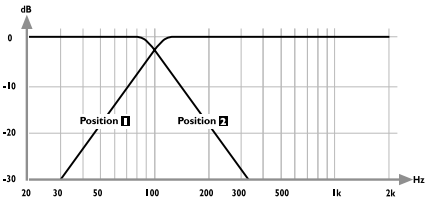
On request all triple C's are available in 6 dB and 12 dB octave.

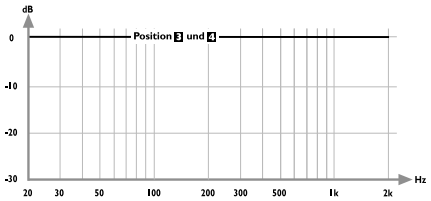
Circuit Control Card Type A



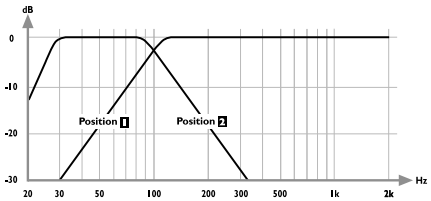


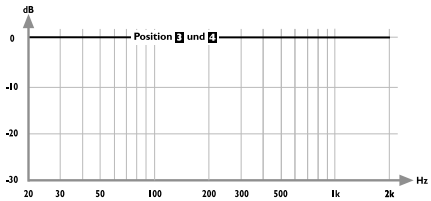
Circuit Control Card Type B





Circuit Control Card Type C





SYMPTOM	POSSIBLE CAUSES	REMEDIES
The amplifier cannot be switched on.	12-volt positive supply lead line interrupted.	Check the power supply fuses and cabling.
	Amplifier not correctly connected to ground/chassis.	Check the connection to the chassis metal
	Power supply to the remote terminal interrupted.	Check the 12-volt remote output of your control unit (radio/tuner).
LEDs light up green but no sound can be heard.	The cinch input cables are not inserted, or the speakers are not connected.	Check that all the cables are properly inserted or screw-fixed.
	There is a faulty connection between the RCA terminal and the control unit.	Check the wiring and replace if necessary.
	The Circuit Control Cards have been taken out or are not properly plugged in.	Check the Circuit Control Cards to ensure that they are properly inserted - see page 8. If necessary, install new cards.
Only one channel is operating.	One channel may not be properly connected to the control unit or speaker.	Check the wiring connections, or swap the channels around.
	One channel has overheated - LED lights up red.	Turn the amplifier off and allow it to cool for a good while. Then switch it on again. If the LED is still showing red, consult your dealer.
	Speaker wiring is faulty (short circuit between the wires or with the chassis of the vehicle); LED lights up yellow.	Check the speaker wires and the speakers themselves for short-circuiting, and rectify as necessary.
	One speaker is faulty.	Replace the defective speaker with a new one.
Interference noise from the engine.	Parasitics in the cinch cable.	Check the connections (screen/shield).
	Parasitics in the power supply cabling.	Replace the cable with screened BRAX POWER TRAX cable. Consult your dealer.
	Feedback interference from the chassis to the control unit (radio/tuner).	Select an optimum central ground point to serve the entire power supply system of your vehicle, including the control unit (radio/tuner).

Please consult your dealer in relation to all other installation problems.

Once again we would urge you to have your dealer perform the installation work. He will be able to guarantee to you that this high-quality amplifier has been correctly installed. Moreover, verification of correct installation by specialist is a prerequisite for the lifetime warranty of your amplifier.

Equipment Features and Control Elements

① Signal Inputs Right Channel

Both inputs **-front and rear-** are marked **red**.
Connect using an RCA cable with cinch connectors.

② Signal Inputs Left Channel

Both inputs **-front and rear-** are marked **white**.
Connect using an RCA cable with cinch connectors.

③ Speaker Terminals

The speakers are connected here in accordance with the required configuration (see Figs. 5 to 7). Cable sizes of up to 6 mm^2 /gauge 10 can be employed for this purpose.

④ CPS-Color Protection System

This shows the operating status of your amplifiers. When the amplifier module is switched on, all LED's briefly light up red and then change to green. This means that all channels of the module are operational. In the event of a malfunction in the amplifier module or a short circuit at the output, the LED for the defective or short-circuited channel switches to yellow. In the event of an amplifier channel overheating, the associated LED switches to red.

Green = operational; **Yellow =** malfunction in the amplifier, short circuit at the speaker output; **Red =** overheating. If the amplifier has tripped owing to overheating, it may take some time, depending on the ambient temperature, before it is re-activated.

⑤ Input Sensitivity Level Controllers

To operate the sensitivity level controllers loosen the screws and remove the gold-plated leaf with logo and series number. Use the enclosed set-screw for this action.
The level controllers enable the input sensitivity of the BRAX amplifiers to be adapted to the output voltage of the connected control unit (radio/tuner). These controllers are not volume controls. Optimum setting of the level controller ensures you maximum audio enjoyment without those all-too-common audible distortions and overshoot phenomena which have such an adverse effect on sound quality.

⑥ Power Supply Terminal

Terminal for connecting the positive 12-volt power supply cable, the ground/chassis lead and the remote lead.

⑦ External Connection for a BRAX Power Stabilizer

⑧ Power ON and Protection LEDs

The power ON LED lights up green when the amplifier is switched on. In the event of one of the two channels overheating, the LED switches to red.

⑨ ⑩ ⑪ ⑫ Card Sockets for CCCs

Sockets are located at the bottom of the amplifier for plugging in the Circuit Control Cards for front and rear and for both the left and the right channels.

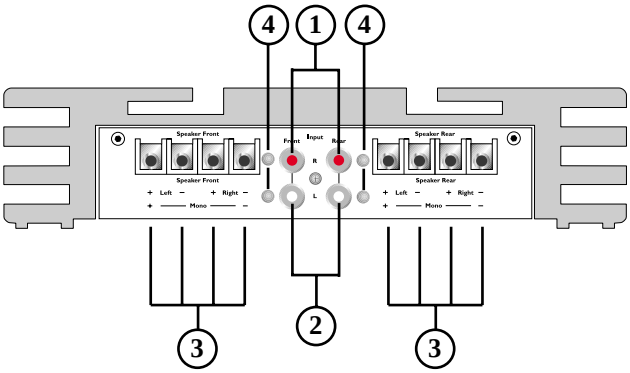
9 = Front left channel
10 = Front right channel
11 = Rear left channel
12 = Rear right channel
(See details on page 7)

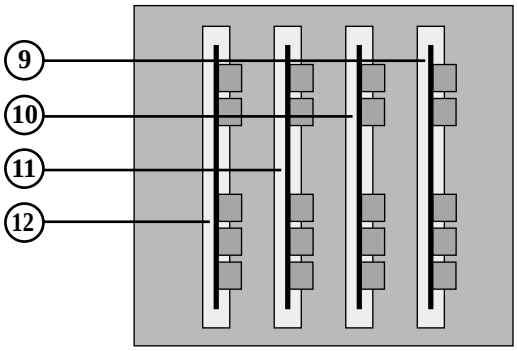
⑬ Selector Rear Mono/Stereo

With this selector the two rear stereo channels can be changed to a mono channel.

⑭ Selector Front Mono/Stereo

With this selector the two front stereo channels can be changed to a mono channel.


4
1
4
Speaker Front
Input
Front
Rear
Speaker Rear
Speaker Front
Speaker Rear
+ Left −
+ Right −
+ Mono −
2
3
3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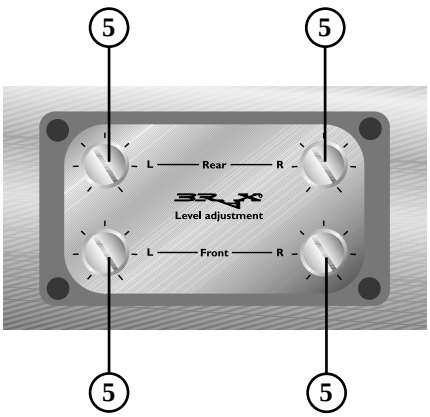
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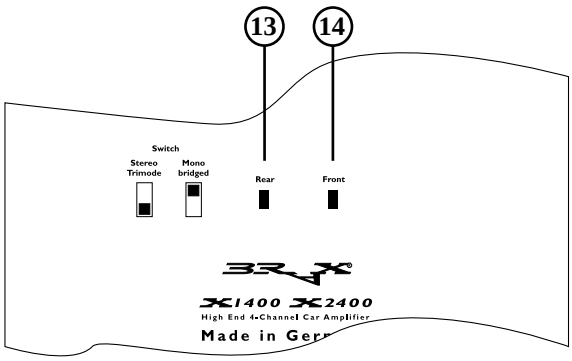
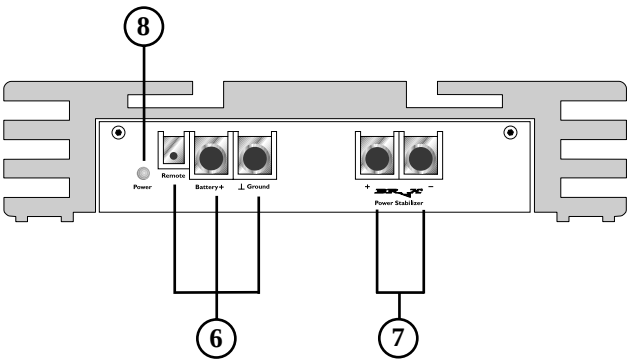
5
L
Rear
R
Level adjustment
L
Front
R
5
5


13
14
Switch
Stereo
Trimode
Mono
bridged
Rear
Front
X1400 X2400
High End 4-Channel Car Amplifier
Made in Ger


8
Power
Remote
Battery+
⊥ Ground
Power Stabilizer
6
7

Technical Specifications

	X 1400	X 2400
Continuous power rating at 4 Ohm per channel	4 x 50 Watts	4 x 100 Watts
Continuous power rating at 2 Ohm per channel	4 x 100 Watts	4 x 200 Watts
Continuous power bridged into a 4 Ohm load	2 x 200 Watts	2 x 400 Watts
Total harmonic distortion (THD)	< 0,002%	< 0,002%
Signal to noise ratio	> 105 dB	> 105 dB
Damping factor at 4 Ohms	> 400	> 400
Frequency response	20 Hz - 20 kHz, +/- 0,2 dB	20 Hz - 20 kHz, +/- 0,2 dB
TIM Distortion	< 0,016 %	< 0,014 %
Input sensitivity	180 mV - 4,8 V	180 mV - 4,8 V
External fuse size	60 A	100 A
Input impedance	10 kOhms	10 kOhms
Circuit Control Card 1, Typ A*	45 Hz/18 dB Subsonic filter and full range	45 Hz/18 dB Subsonic filter and full range
Dimensions (H x W x D) in mm	53 x 238 x 470	53 x 238 x 470
Weight net	7,4 kg	7,6 kg

*Other Circuit Control Cards available on request.

Standard housing designs: bi-color; black/gold or silver/gold.

Chrome- or gold housing available as an optional extra.

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MADE IN GERMANY

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